

Obesity and diabetes spotlight

Explore various ways to identify obesity and diabetes
with the precision of MarketScan databases.





According to the National Institutes of Health, nearly 31% of Americans are overweight and 42% are considered obese.¹ Being overweight or obese contributes to the risk of developing many health problems, including high blood pressure, heart disease, stroke, sleep and breathing problems, and type 2 diabetes.¹ As such, studying disease etiology and the complications, comorbidities, and treatment patterns in overweight and obese populations is of great interest to healthcare stakeholders.

Real-world data sources are instrumental in researching obesity and related health issues, but they come with various limitations depending on how the data are collected and processed. Being able to fully appreciate the nuances of the data you work with will translate into better study design and more robust analyses. Our team is proud to share several recent analyses and findings related to obesity and diabetes, highlighting the importance of the topic and the capabilities of the MarketScan® by Merative™ databases.

How reliable is BMI diagnosis in claims?

In administrative claims, obesity can be identified via ICD-10-CM diagnosis codes. More specifically, the Z68xx diagnosis codes provide body mass index (BMI) ranges that can be mapped to underweight, normal weight, overweight, and obese. In addition, diagnosis codes E6601-E669 are indicative of overweight or obese without specific BMI information. There are also diagnosis codes for obesity and bariatric surgery complicating pregnancy and childbirth which suggest obesity.

As researchers launch obesity-related studies using administrative claims as a data source, one important question to ask is how reliable the BMI-based obesity diagnosis codes are. [Featured in a 2023 Global ISPOR poster](#), our researchers validated claims-based BMI diagnoses using the linked MarketScan Claims and Electronic Health Record (EHR) Database (CED).² Patients with a BMI diagnosis (Z68xx) on claims were compared to corresponding BMI values in their linked EHR. The researchers confirmed that BMI reporting in claims was generally low. When reported, the diagnoses from claims and the BMI recorded in patients' EHR agreed 79%, 85%, 88%, and 98% of the time for underweight, normal weight, overweight, and obesity, respectively (Figure 1). **It was concluded that "diagnoses indicating BMI on medical claims can be reliably used to identify patients with overweight and obesity"**.

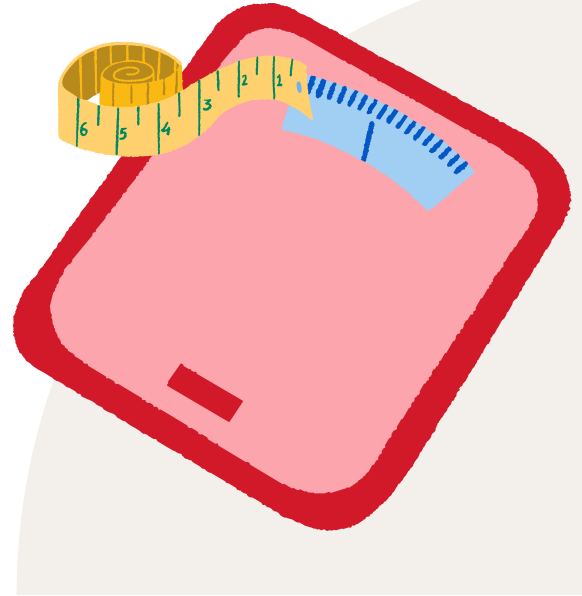
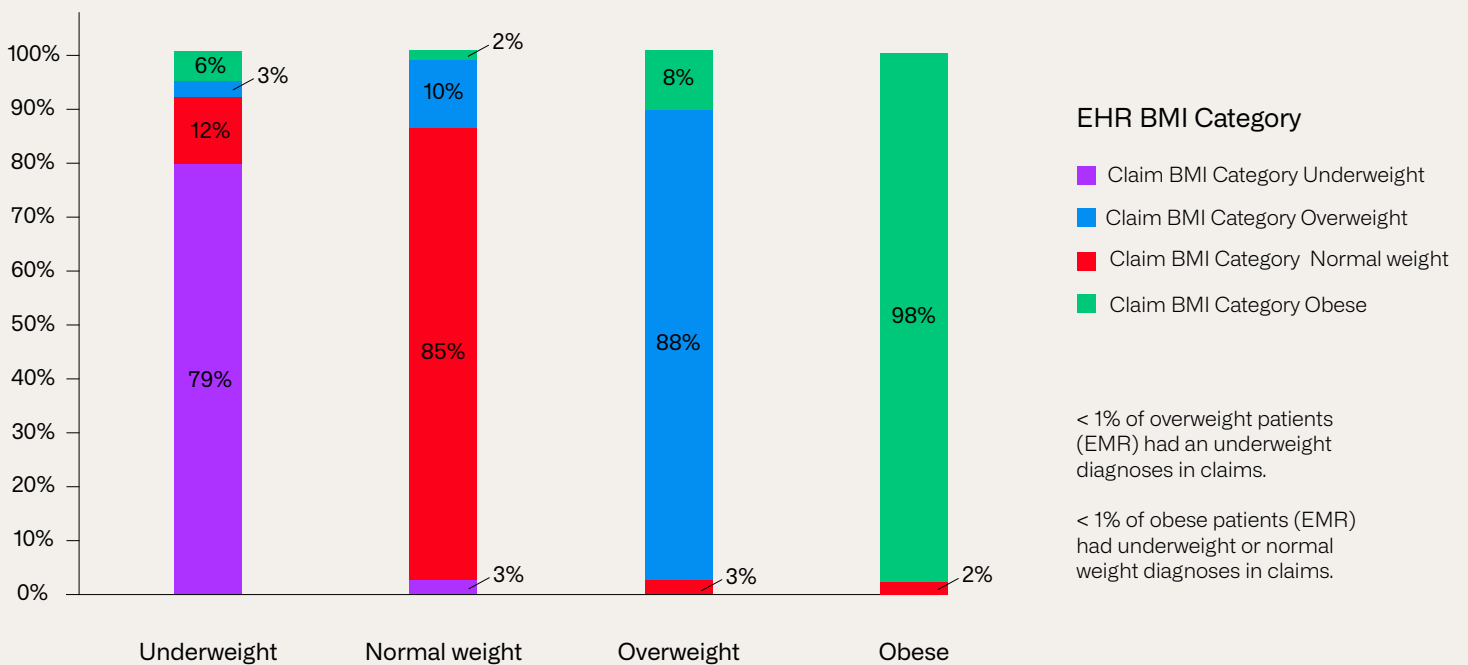


Figure 1: Distribution of BMI category according to diagnoses in claims by EHR BMI category



Estimation of prevalence of obesity and overweight

The under-reporting of obesity diagnoses on claims can potentially bias the estimation of prevalence and incidence of obesity when using claims as a data source. To better understand and address the issue of under-reported BMI, our researchers estimated and compared the rates of overweight and/or obese patients during 2017-2021 using three different databases from the MarketScan portfolio:

The Commercial and Medicare Claims (CMC) Database

contains United States (US) data on the full healthcare experience for individuals with employer-sponsored commercial insurance for employees and dependents or Medicare insurance for retirees and dependents.

- Enrollees were required to have at least one outpatient visit during the reporting period, thus increasing the likelihood of getting height and weight measured and a BMI value recorded.
- ICD-10 diagnosis codes indicating BMI and associated ranges were used to define BMI categories.

The MarketScan Health Risk Assessment (HRA) Database is an integrated database that contains self-reported biometric and behavioral health information from employee survey responses.

- BMI was calculated based on self-reported height and weight information.

The MarketScan CED Database links the above CMC Database with an EHR database sourced from large integrated health systems across the US.

- BMI was obtained through Logical Observation Identifiers Names and Codes (LOINC) codes.

In populations of about 2 million patients from each data source, the rates of overweight, obese, and combined (overweight + obese) patients were similar across all three databases. Further, the results corroborated with the Centers for Disease Control and Prevention (CDC) reporting of overweight and obesity in the United States totaling 74%.³ [These findings were presented](#) at the 2023 European ISPOR conference.⁴

	Overweight	Obese	Combined
CED	32%	43%	75%
CMC	35%	43%	78%
HRA	38%	36%	74%

HRA database for undiagnosed obesity

Sourced from large employers and health plans in the US, the HRA database is linkable to the MarketScan Commercial Database. These linkages provide a unique and valuable resource for examining the relationship between health risks/ behaviors and healthcare utilization, expenditures, and clinical outcomes for diseases like obesity and smoking. For example, while we can reliably identify obese patients from claims, what if an obese patient never seeks medical care and is not “officially” diagnosed?

The linkage between self-reported BMI from the HRA and an obesity diagnosis from claims can help identify undiagnosed and likely untreated obese patients. A snapshot of the linked HRA and the Commercial Database identified more than 305,000 obese patients with 12 months continuous enrollment in 2021. **Of those identified, 29% (89,357) were flagged by self-reported BMI only, but did not have an obesity diagnosis in claims.** While this echoes obesity being underreported in claims, these undiagnosed patients can potentially serve as controls in obesity studies.

As with any studies using real-world data, there are inherent limitations with the data because they are unlikely created for research purposes. The above analyses demonstrate the strength and precision that the MarketScan databases bring to obesity and diabetes studies. However, researchers must thoughtfully mitigate data source limitations when selecting patient samples, measuring study outcomes, and addressing potential selection biases.

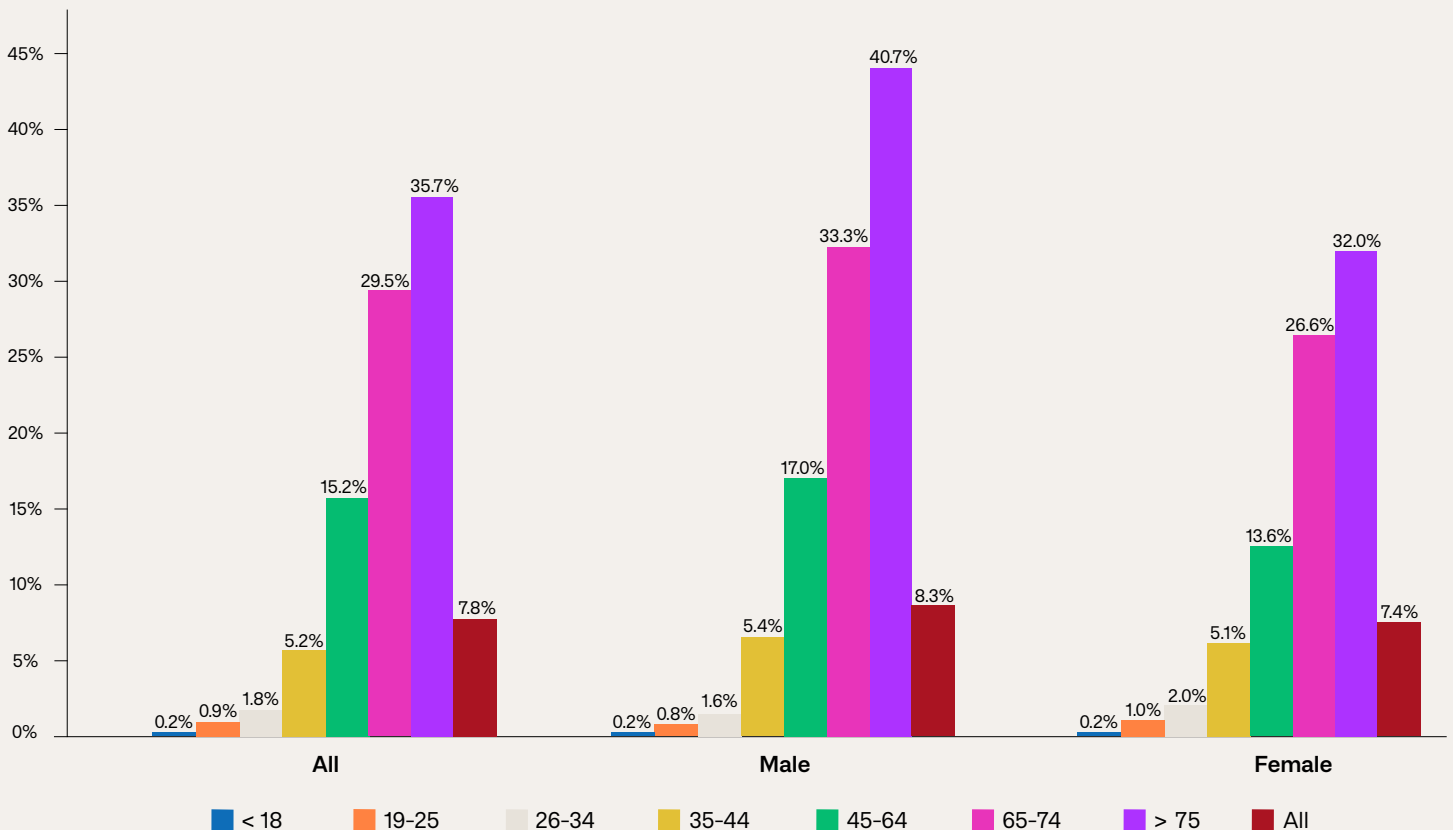
Period prevalence for type 2 diabetes

Obesity and overweight diagnoses remain prevalent in the US and obese patients are typically high-risk for developing type 2 diabetes. To obtain an update on type 2 diabetes prevalence, our researchers once again turned to our MarketScan Commercial and Medicare Claims Database for insights.

The overall 10-year period prevalence of type 2 diabetes was 7.8%, slightly lower than the CDC's report of 1 in 10 Americans living with type 2 diabetes.⁵ The prevalence of diabetes grew steadily as age increased, and overall, males were slightly more likely to have type 2 diabetes than females (8.3% vs 7.4%). The gender difference was more pronounced in adults older than 45.



Figure 2: Period prevalence of type 2 diabetes



*The denominator of the prevalence rate included all enrollees who had at least 1 day enrollment in the databases in 2022. The numerator included eligible enrollees who had a diagnosis for type 2 diabetes between 2012 and 2022. The prevalence rates may be underestimated due to 1) Patients with diabetes did not seek medical services during 2012-2022; 2) Patients disenrolled from the databases between 2012-2022; as a result, MarketScan did not have the full picture of their healthcare experiences.

Every month, our team pulls together a report with our latest findings and perspectives. With December approaching and National Influenza Vaccination Week around the corner, we will highlight studies on influenza reporting using MarketScan databases in our next blog. With more than 4,500 peer-reviewed publications and over 25 years of longitudinal data, MarketScan has the data and expertise you need for every stage.

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About Merative

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Merative helps clients orient information and insights around the people they serve to improve decision-making and performance. Merative, formerly IBM Watson Health, became a new standalone company as part of Francisco Partners in 2022.

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